

Setting a New Standard for Career Technical Education

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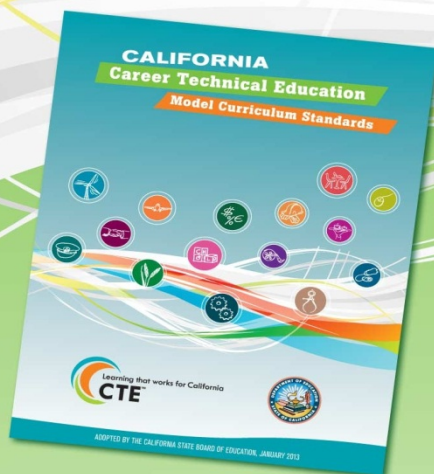


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California's Career Technical Education:

Preparing Students for the 21st Century and Beyond



The newly revised standards include:

- Standards for Career Ready Practice
- Alignment with the Common Core State Standards
- Revisions to the industry sectors to be in line with the business community
- New pathways such as Games and Simulation, International Business, Mental and Behavioral Health, and Emergency Response



<http://www.cde.ca.gov/ci/ct/sf/ctcmstandards.asp>



CTE Standards

The CTE standards
are a tool to:

- Foster the ***Career Readiness*** of all students.
- Support mastery of essential **employability skills** and rigorous **academic content**
- Develop a **highly skilled and educated** workforce which contributes to **economic prosperity**
- Support a **seamless transition** to postsecondary education and/or career entry
- Improve **student achievement**
- Put **knowledge** into **practice**



CTE Standards

CTE Shared Criteria with CCSS:

- Fewer, clearer, deeper
- Research and evidence based
- Reasonable in scope
- Essential, rigorous, clear, specific and coherent
- Aligned with postsecondary and work expectations
- Measurable



Framework for Standards Development

Research

- Bloom's Taxonomy (Revised)
- Depth of Knowledge - Norman L. Webb
- Knowledge Dimension - Anderson, Lorin and David Krathwohl
- Rigor and Relevance Framework – Bill Daggett



Beyond Knowledge Construct

Knowledge

Metacognitive

form a coherent whole

Procedural

how parts relate, find
Coherence

Conceptual

clarify, give examples

Factual

recognize, recall, locate

Performance

Use

one-step
process to
solve routine
problems

Apply

multiple step
process to solve
routine
problems

Solve

non-routine
problems using a
sequence of
steps

Create

solutions to non-
routine real world
complex problems
using multiple
steps and sources



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Verbs

Factual

Access
Define
Describe
Find
Identify
Label
List
Locate
Match
Name
Recall
Recite
Recognize
Remember
Retrieve
Select
State

Conceptual

Adhere
Apply
Classify
Communicate
Compare
Demonstrate
Develop
Discriminate
Employ
Explain
Implement
Infer
Interpret
Maintain
Organize
Participate
Practice
Promote
Summarize
Transfer
Understand
Use

Procedural

Analyze
Assess
Comply
Compare
Contrast
Deconstruct
Deduce
Defend
Detect
Diagram
Differentiate
Discern
Distinguish
Enhance
Evaluate
Experiment
Explore
Illustrate
Integrate
Research
Solve
Test

Metacognitive

Advocate
Build
Compile
Compose
Construct
Create
Design
Devise
Formulate
Invent
Plan
Predict
Produce
Reconstruct
Reorganize
Synthesize



CTE Standards

Previous Design

- 15 Industry Sectors
 - Foundation Standards
- 58 Pathways
 - Pathway Standards

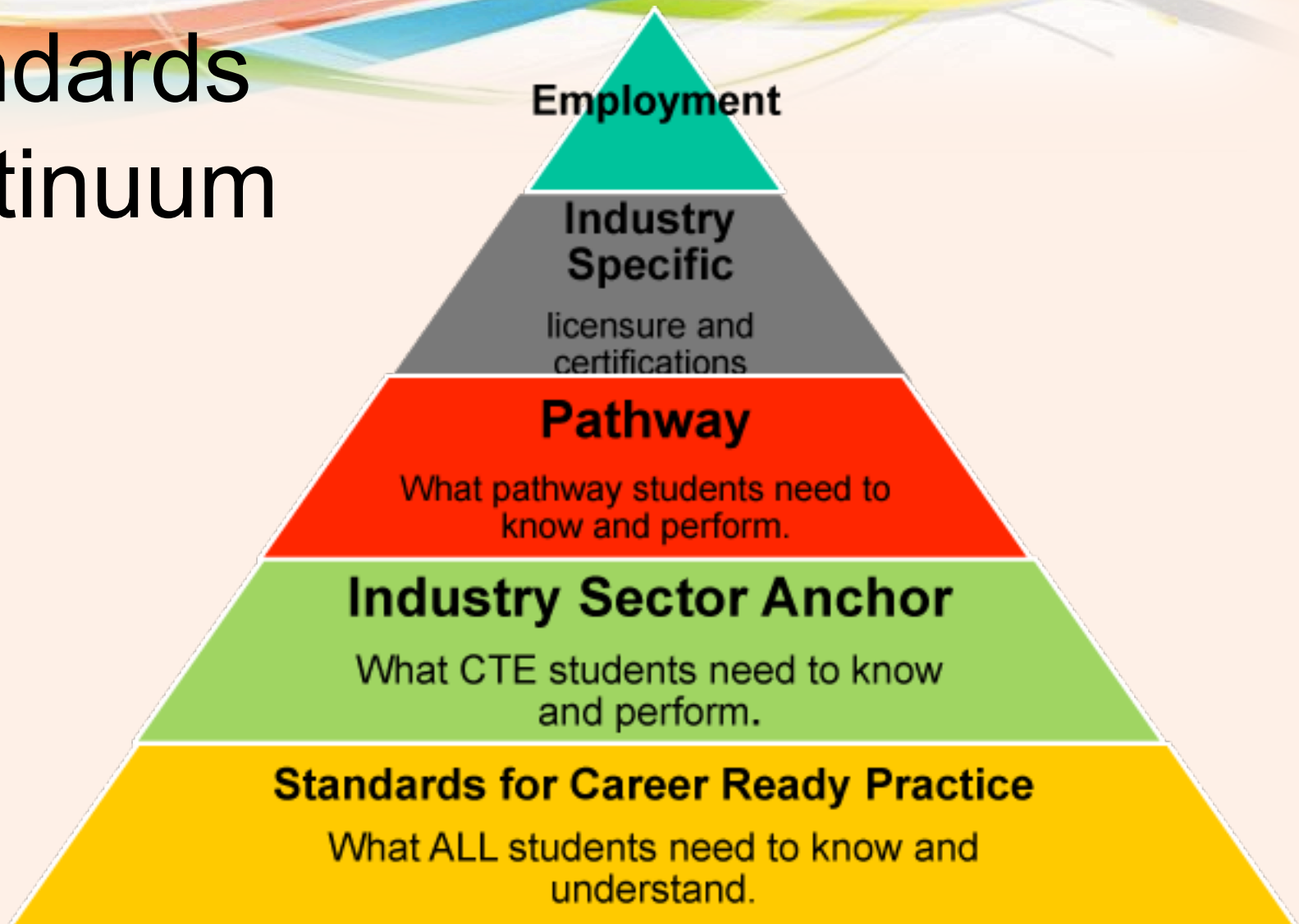


Current Design

- Standards for Career Ready Practice
- 15 Industry Sectors
 - Anchor Standards aligned with CCSS
- 58 Pathways
 - Pathway Standards



Career Technical Education Standards Continuum



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Standards for Career Ready Practice

- Adopted from the Common Career Technical Core
(National Association of Directors of Career Technical Education)
- Intended as a goal for all students either:
 - Prior to entering a Career Technical Education pathway
 - Integrated in a Career Technical Education pathway
 - Integrated into other coursework in preparation to meet career and college readiness



Standards for Career Ready Practice

- Apply appropriate technical skills and academic knowledge.
- **Communicate clearly, effectively, and with reason.**
- Develop an education and career plan aligned to personal goals.
- **Apply technology to enhance productivity.**
- Utilize critical thinking to make sense of problems and persevere in solving them.
- **Practice personal health and understand financial literacy.**



Standards for Career Ready Practice

- Act as a responsible citizen in the workplace and the community.
- Model integrity, ethical leadership, and effective management.
- Work productively in teams while using cultural/global competence.
- Demonstrate creativity and innovation.
- Employ valid and reliable research strategies.
- Understand the environmental, social, and economic impacts of decisions.



Standards for Career Ready Practice

- Example

Develop an education and career plan aligned to personal goals.

Career-ready individuals take personal ownership of their own educational and career goals and manage their individual plan to attain these goals. They recognize the value of each step in the educational and experiential process, and that nearly all career paths require ongoing education and experience to adapt to practices, procedures, and expectations of an ever changing work environment. They seek counselors, mentors, and other experts to assist in the planning and execution of education and career plans.



CTE Anchor Standards

1. ACADEMICS
2. COMMUNICATIONS
3. CAREER PLANNING & MANAGEMENT
4. TECHNOLOGY
5. PROBLEM SOLVING & CRITICAL THINKING
6. HEALTH & SAFETY
7. RESPONSIBILITY & FLEXIBILITY
8. ETHICS & LEGAL RESPONSIBILITIES
9. LEADERSHIP & TEAMWORK
10. TECHNICAL KNOWLEDGE & SKILLS
11. DEMONSTRATION & APPLICATION



CTE Anchor Standards

- Drawn from
 - *Preparing Students for the 21st Century Economy* (American Association of Colleges of Teacher Education and Partnership for the 21st Century)
 - *Skills and Assessments: What Business Wants* (American Association of Colleges and Universities and Peter D. Hart Research Associates, Inc)
 - *Importance of Skills and Knowledge for College and Career Readiness* (MetLife Survey of The American Teacher)
 - *Are They Really Ready to Work?* (Employers' Perspectives on the Basic Knowledge and Applied Skills of New Entrants to the 21st Century U.S. Workforce)



CTE Anchor Standards

- **Build on** the Standards for Career Ready Practice
- **Common** across the 15 industry sectors
- **Apply to all pathways** within a specific industry sector
- Anchor Standard 1: **Academics**, guides users to the sector specific core academic standards **related to each industry sector**, which are listed in the **Alignment Matrix** located at the end of each sector section.
- Anchor standards 2-10 are **deliberately aligned** to one of the **Common Core English Language Arts** standards
- Anchor Standard 11: Demonstration and Application, **highlights classroom, laboratory and workplace learning** specific to the individual sector and pathways.



Anchor Standards Alignment

Energy, Environment, and Utilities

ELA Common Core Standard: Writing Standard

Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback including new arguments and information

CTE Anchor Standard 5: Problem Solving and Critical Thinking

Use existing and emerging technology to investigate, research, and produce products and services, including new information, as required in the Engineering and Architecture sector workplace environment. (Direct alignment to WS 11-12.6)



Anchor Standards Alignment

Agriculture and Natural Resources

Former Foundation Standard: Communications

Students understand the principles of effective oral, written, and multimedia communications.

ELA Common Core Standard: Listening & Speaking

Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the career and college readiness level (LS 11-12.6)

New Anchor Standard 2: Communications

Acquire and use accurately, Agriculture and Natural Resources sector terminology and protocols at the career and college readiness level for communicating effectively in oral, written, and multimedia formats. (Deliberate Alignment)



Anchor Standard with Performance Indicators

2.0 Communications

Acquire and use accurately, Agriculture and Natural Resources sector terminology and protocols at the career and college readiness level for communicating effectively in oral, written, and multimedia formats.

- Recognize the elements of communication using a sender–receiver model.
- Identify barriers to accurate and appropriate communication.
- Interpret verbal & nonverbal communications and respond appropriately.
- Demonstrate elements of written and electronic communication, such as accurate spelling, grammar and format.
- Communicate information and ideas effectively to multiple audiences using a variety of media and formats.
- Advocate and practice, safe, legal and responsible use of digital media information and communication technologies.



Anchor Standards

Career Ready Practice

Develop an education and career plan aligned to personal goals.

Industry Sector Anchor Standard

Career Planning and Management

Integrate multiple sources of career information from diverse formats to make informed career decisions and manage personal career plans.

Aligns with English Language Arts Standard

Reading Standards for Informational Text:

Integrate and evaluate multiple sources of information presented in different media or formats as well as in words in order to address a question or solve a problem. (RSIT 11-12.7)



Pathway Standards

- Unique within an industry sector
- Organized by careers within the industry sector of similar functions, services, and work environments
- Describe what students should know and be able to do once the standards content is achieved
- Build from simple to complex knowledge and performance
- Incidental Alignment with Academic Standards



Identification Criteria

- Has an occupational focus
- Consistent in size and scope
- Comprised of similar functions
- Inclusive of all aspects of the industry
- Includes 8-12 pathway specific standards
- Demonstrates sequence potential
- Lead to high skill, high wage, or high demand jobs
- Reasonable and appropriate for high school
- Sustainable and viable over next 10 years



Pathway Standards Alignment

Alignment Process:

- Identified pathway standards that have a substantial and natural alignment to a core curriculum standard
- Determined if the pathway standard would enhance, reinforce or apply a specific core subject standard
- Developed an alignment matrix at end of each Industry Sector



TRANSPORTATION	PATHWAYS		
	A. Operations	B. Structural Repair and Refinishing	C. Systems Diagnostics and Service
ENGLISH LANGUAGE ARTS			
Reading Standards for Literacy in Science and Technical Subjects - RLST (Standard Area, Grade Level, Standard #)			
11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.	A6.0	B1.0, B2.0, B3.0, B4.0, B6.0, B7.0, B8.0, B9.0	C1.0, C2.0, C5.0
11-12.10 By the end of grade 12 read and comprehend science/technical texts in the grades 11 -12 text complexity band independently and proficiently.	A1.0, A2.0, A3.0, A4.0, A5.0, A6.0, A7.0	B1.0, B2.0, B3.0, B4.0, B5.0, B6.0, B7.0, B8.0, B9.0	C1.0, C2.0, C3.0, C4.0, C5.0, C6.0, C7.0, C8.0
Writing Standards - WS (Standard Area, Grade Level, Standard #)			
11-12.1 Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.	A5.0	B5.0	C5.0
11-12.2 Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.	A7.0	B5.0	C5.0
11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.	A3.0, A4.0,	B5.0	C4.0
11-12.6 Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.	A1.0, A3.0 A4.0	B2.0, B3.0, B5.0, B6.0, B8.0, B9.0	C6.0, C7.0
11-12.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.	A1.0, A2.0		C8.0
11-12.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.	A1.0	B5.0	C4.0

Pathway / Academic Alignment

C4.0 Perform and document maintenance procedures in accordance with the recommendations of the manufacturer.

- C4.1 Communicate the procedures and practices of various manufacturers regarding service, repair and maintenance schedules.
- C4.2 Demonstrate how to properly document maintenance and repair procedures in accordance with applicable rules, laws, and regulations (e.g., Bureau of Auto Repair [BAR], Occupational Health and Safety Administration [OSHA], and the California Air Resources Board [CARB]).
- C4.3 Use reference books, technical service bulletins, and other documents and materials related to the service industry available in print and through electronic retrieval systems to accurately diagnose and repair systems, equipment, and vehicles.
- C4.4 Complete a work order, including customer information, description of repairs, and billing information, in accordance with applicable rules, laws, and regulations.



Reading – High School CTE Applications

Literacy in Science & Technical Subjects

Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.(11-12.RSTS.3)

CTE Application: Patient Care

B8.0 Demonstrate the principles of body mechanics as they apply to the positioning, transferring, and transporting of patients.

B8.1 Explain the principles of body mechanics.

B8.2 Determine appropriate equipment for transportation and transfer, including the modification of equipment and techniques to accommodate the health status of the patient.

B8.5 Integrate proper body mechanics, ergonomics, safety equipment, and techniques to prevent personal injury to patients and clients.



Mathematics-High School: CTE Applications

Apply geometric concepts in modeling situations

Use geometric shapes, their measures, and properties to describe objects
(HS G-MG.1)

CTE Application: Forestry and Natural Resources

- 11.0 Students understand the basic concepts of measurement, surveying and mapping (A & NR E11.0)
- 11.2 Use surveying equipment, including global positioning satellites, maps, and a compass to determine area, boundaries, and elevation differences.
- 11.4 Create a management plan map that includes layer information and data points from global information systems.



Mathematics-High School: CTE Applications

Similarity, Right Triangles and Trigonometry

Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems. (HS G-STR 8)

CTE Application: Residential and Commercial Construction

D2.0 Apply the appropriate mathematical calculations used in the construction trades.

D2.2 Apply the Pythagorean Theorem to calculate pipe offsets, roof slope, and check for square.

D4.0 Demonstrate techniques for proper site preparation.

D4.4 Check site layout for square using the diagonal method.



Life Science-High School: CTE Applications

Heredity: Inheritance and Variation of Traits (LS3)

Inheritance of Traits (LS3.A)

Variation of Traits (LS3.B)

CTE Application: Animal Science

Discuss animal inheritance and selection principles, including the structure and role of DNA (A & NR D5.0)

- 5.1 Evaluate a group of animals for desired qualities and discern among them for breeding selection.
- 5.4 Predict phenotypic and genotypic results of a dominant and recessive gene pair.
- 5.5 Research the role of mutations, both naturally occurring and artificially induced, & hybrids in animal genetics



Common Core Alignment

Business and Finance

Conduct short as well as more sustained research projects to answer a question or solve a problem . . .demonstrating understanding of the subject under investigation (Writing Standards for Science and Technical Subjects 11-12.7)

Business & Finance	Alignment
Anchor Standard	5.0 Problem Solving and Critical Thinking
Pathway: Business Management	A1.0, A2.0, A3.0, A4.0, A5.0, A6.0, A7.0, A8.0, A9.0
Pathway: Financial Services	B1.0, B2.0, B3.0, B4.0, B5.0, B6.0, B7.0, B8.0, B9.0, B10.0
Pathway: International Business	C1.0, C2.0, C3.0, C4.0, C5.0, C6.0, C7.0, C8.0



Common Core Alignment

Business and Finance

Choose a level of accuracy appropriate to limitations on measurement when reporting quantities (Algebra – Reasoning with Equations and Inequalities A-REI3)

Business & Finance	Alignment
Anchor Standard	None
Pathway: Business Management	None
Pathway: Financial Services	B1.0, B3.0, B4.0, B5.0, B6.0, B7.0, B8.0, B10.0
Pathway: International Business	C3.0, C4.0, C6.0, C7.0, C8.0





Mike McCoy Section

End with Pathways to Prosperity section



The Harvard study, Pathways to Prosperity (February 2011)

“The message is clear: in 21st century America, education beyond high school is the passport to the American Dream. But how much and what kind of post-secondary is really needed to prosper in the new American economy?”





Twenty-seven percent of people with post-secondary licenses or certificates-credentials short of an associate's degree-earn more than the average bachelor's degree recipient.

These middle skill jobs include

- Electrician
- Dental hygienist
- Construction manager
- Paralegal
- Police officer



The Harvard study implies that a focus on college readiness alone does not equip young people with all of the skills and abilities they need in the workplace, or to successfully complete the transition from adolescence to adulthood.



Resources

- Full text of the Common Core State Standards:
<http://www.scoe.net/castandards/index.html>
- Information about the common core: <http://www.corestandards.org/>
- Information about the common core including implementation timelines:
<http://www.cde.ca.gov/ci/cc/>
- SBAC information: <http://www.smarterbalanced.org/>
- Center for K-12 and Performance Management at ETS:
<http://www.k12center.org/publications.html>
- Achieve: <http://www.achieve.org/>
- Career Technical Education Model Curriculum Standards & Framework
<http://www.cde.ca.gov/ci/ct/sf/>
- Curriculum development and model lessons CTE Online:
<http://www.cteonline.org>
- California Career Resource Network (CalCRN):
<http://www.californiacareers.info>



THANK YOU

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